Claims

1. An improved thiosulphate leach process, the process characterised by the method steps of submitting a gold-bearing material to a leach in a thiosulphate solution, wherein thiourea or a reagent chemically related thereto, and at least one oxidant, are present in the thiosulphate leach solution, and subsequently recovering gold from the resulting pregnant leach solution.

2. A process according to claim 1, wherein thiourea is provided in a concentration of about 0.01 mole/L.

3. A process according to claim 1 or 2, wherein the oxidant present is a complex of ethylenediamenetetraacetate (EDTA) with a multivalent metal.

4. A process according to claim 3, wherein the multivalent metal is iron and the complex FeEDTA.

5. A process according to any one of the proceeding claims, wherein thiosulphate is added in the form of a soluble salt.

6. A process according to claim 5, wherein the soluble salt is the sodium salt of thiosulphate.

7. A process according to any one of the preceding claims, wherein thiosulphate is provided in a concentration of about 0.1 to 0.3 mole/L.

8. A process according to any one of claims 4 to 8, wherein the oxidant FeEDTA is prepared prior to addition to the leach solution.

9. A process according to any one of claims 4 to 8, wherein the oxidant FeEDTA is prepared by adding suitable amounts of iron salts and EDTA directly to the leach solution.

10. A process according to any one of claims 4 to 9, wherein the concentration of FeEDTA in the leach solution is about 0.002 mole/L.

11. A process according to any one of the preceding claims, wherein the pH of the leach is preferably maintained between about 6 to 7.

12. A process according to any one of the preceding claims, wherein the reagent chemically related to thiourea is a thio-substituted organic compound.

13. A process according to claim 12, wherein the reagent chemically related to thiourea is one of formamidine disulphide or thiosemicarbazide.

14. An improved thiosulphate leach process for the recovery of gold from ores and other gold-bearing materials, characterised in that the leach solution comprises thiosulphate, thiourea or a reagent chemically related thereto, and an oxidant that does not oxidise thiosulphate, the process producing a pregnant leach solution from which gold may be recovered.

15. A process according to claim 14, wherein the oxidant present is a complex of ethylenediamenetetraacetate (EDTA) with a multivalent metal.

16. A process according to claim 15, wherein the multivalent metal is iron and the complex FeEDTA.

17. A process according to any one of claims 14 to 16, wherein the FeEDTA is provided at a concentration of about 0.002 mole/L.

18. A process according to any one of claims 14 to 17, wherein the thiosulphate is provided at a concentration of between about 0.1 to 0.3 mole/L.

19. A process according to any one of claims 14 to 17, wherein thiourea is provided at a concentration of about 0.01 mole/L.

20. A process according to any one of claims 14 to 18, wherein gold is recovered from the pregnant leach solution by way of either cementation or ion exchange.

21. A process according to any one of claims 14 to 19, wherein the pH of the leach is preferably maintained between about 6 to 7.

22. A process according to any one claims 12 to 21, wherein the reagent chemically related to thiourea is a thio-substituted organic compound.

23. A process according to claim 22, wherein the reagent chemically related to thiourea is one of formamidine disulphide or thiosemicarbazide.

24. An improved thiosulphate leach process substantially as hereinbefore described with reference to Examples 2 to 6.